

Laboratory honors four with this year's Fellows Award

by Tim Anderl, AFRL Headquarters

WRIGHT-PATTERSON AFB, OHIO — The Air Force Research Laboratory recently honored four of its finest scientists and engineers during the 2000 Fellows Day celebration at the U.S. Air Force Museum. The Fellows Award confers a lifetime status, and recognizes outstanding contributions in research and development and/or exceptional technical program management.

During the ceremony, Air Force Materiel Command commander General Lester Lyles said, "I am confident that whatever new horizons there are, whatever things are still yet to be discovered, a lot of those things and discoveries will be done by the people of the Air Force Research Laboratory, the likes of whom we're going to be honoring tonight."

Four scientists were honored during the event, Dr. Edward Altshuler, Dr. Susan

Gussenhoven-Shea, Dr. Daniel B. Miracle and Dr. Daniel W. Repperger, have conducted their outstanding work at directorates housed at Wright-Patterson AFB and Hanscom AFB.

Altshuler, who was born in Boston, Mass., studied in Massachusetts where he received a bachelor's degree at Northeastern University, master's at Tufts University and doctorate from Harvard. In 1960, he joined the Air Force Cambridge Research Labs — now the Air Force Research Laboratory Sensors Directorate.

Since then, he has become internationally recognized for his contributions to the science and technology of ordered intermetallic alloys and metallic composite materials.

Altshuler is an expert in the field of electromagnetics who has made significant contributions to the Air Force, DoD, NATO and the scientific community. In the early sixties he investigated the feasibility of using the millimeter-wave region of the spectrum for military applications. He recognized that high-gain, high-



THEY'RE THE JOLLY GOOD FELLOWS — AFMC Commander General Lester Lyles, far left, and AFRL Commander General Paul Nielsen, far right, congratulate Dr. Edward Altshuler, Dr. Daniel Miracle, Dr. Susan Gussenhoven-Shea, and Dr. Daniel Repperger during the Fellows induction ceremony on November 7.

resolution antennas of moderate size, and compact, lightweight system components that can be obtained at these wavelengths, were applicable to space vehicle instrumentation.

More recently, he received a patent for a process for the design of antennas using Genetic Algorithms. Altshuler has participated in over 100 scientific publications, patents and presentations.

Altshuler has held a number of positions in the Institute of Electrical and Electronic Engineers (IEEE) organization, including receiving Fellow grade in 1984 and being elevated to Life Fellow in 1995. He is currently Chairman of the IEEE Boston Section Life Members Chapter. He also serves on the Antennas and Propagation Society Awards Committee. He received the IEEE Harry Diamond Memorial Award in 1997 and was recently awarded the IEEE Millennium Medal.

When Altshuler isn't busy with his research or professional organizations, he spends time doing projects around

his home. His principal projects have included converting a screened porch to a den, and designing and building a heated walkway, stairs and heated driveway. He also spends time in his garden growing vegetables.

Though Dr. Mary Susan Gussenhoven-Shea was born in Havre, Montana, she spent her childhood in Lewiston, Idaho where her father taught her to “milk cows, wield a hammer and solve algebraic equations.” Gussenhoven-Shea earned her bachelor’s degree from Mount Holyoke College, and master’s from Minnesota. After teaching high school physics in Kingston Jamaica, she entered the newly formed doctorate program in Space Physics at Boston College.

Gussenhoven-Shea worked as an Air Force contractor at the Geophysics Laboratory at Hanscom AFB, and in 1983 she joined the laboratory — now the Air Force Research Laboratory Space Vehicles Directorate — to head up the Combined Release and Radiation Effects Satellite Science Team.

Recognized as a leading expert in three areas of space research: auroral physics, spacecraft charging, and space radiation effects, she has been sought by NASA to serve as an expert on their teams.

During her time with the lab, she has garnered leadership roles in the Spacecraft Charging at High Altitudes, and Combined Release/Radiation Effects Satellite programs. These satellites carried the most advanced set of experiments ever flown to study spacecraft arcing and microelectronic upsets.

During her time away from the lab, Gussenhoven-Shea can be found renovating old single family houses, with as much restoration as possible, under the requirement of modern kitchens, bathrooms, electrical, etc.

“My first effort was a single floor apartment in a brick townhouse, in East Boston, built in the 19th Century and overlooking Boston Harbor. It was the same building that Joseph Kennedy — father of the president — brought his bride to when he came to America.”

Her efforts have included a farmhouse in Yellow Springs, Ohio, a Victorian house, built in 1865, in Boston and her latest and final effort is a tavern in Corinth, Vermont, built in 1795. Her interest in old houses extends membership in historical societies, participation in estate auctions, and repairing and restoring old furniture.

In addition, Gussenhoven-Shea has raised Old English Sheepdogs, which led to her involvement in the New England Old English Old English Sheepdog Rescue organization. She is active as a member, and foster caregiver. She enjoys taking her dogs for walks in the Arnold Arboretum.

Miracle, who was born in Cleveland, Ohio, received his bachelor’s degree at Wright State University before joining the Air Force Materials Laboratory — now the Air Force Research Laboratory Materials and Manufacturing Directorate. He obtained his doctorate from Ohio State University through a Long-Term Full-Time Training grant sponsored by the Air Force.

Since then, he has become internationally recognized for his contributions to the science and technology of ordered intermetallic alloys and metallic composite materials.

His research has led to significant advancements in intermetallic alloys and metal matrix composites (MMC’s). His early studies on intermetallic alloys contributed to the successful engine demonstration of an advanced NiAl single crystal vane alloy, which has shown a dramatic improvement in the thrust-to-weight ratio of advanced gas turbine engines.

His recent research on MMCs contributed to the first Air Force specification of a fiber-reinforced metal matrix composite, and the first aerostructural component of particle-reinforced MMC. The latter application resulted in a \$26 million savings to the Air Force.

Miracle has held a number of additional positions, including Visiting Fellow at Cambridge University (UK), Scientific Officer at the Office of Scientific Research and Adjunct Faculty member at Wright State University. He is a Fellow of ASM International and has received the Outstanding Research Scientist Award from the Affiliate Societies Council of Dayton.

When Miracle isn’t commuting to the office via bicycle for a day’s work — which he said he does regularly, Miracle can be found participating in organized bike rides. Miracle has ridden a two-day, 210-mile bike ride almost every year for the past ten years. He has also organized cross country trips for a local boy scout troop — a 650-mile ride to Canada, and a 470-mile, round-trip ride to Cedar Point amusement park.

“I am also an avid fly fisher. I take trips each year to Michigan to fish for steelhead and salmon,” Miracle said. “I have taken the opportunity during my travels to fish a number of more exotic sites, including Montana, Utah and New Zealand.”

Miracle said he also enjoys photography, woodworking and traveling.

Dr. Daniel W. Repperger arrived in Dayton in 1973 following his graduation from Purdue University, Indiana. He joined the Aeromedical Research Laboratory, now the Human Effectiveness Directorate, in 1975 after his work as a postdoctoral fellow with the National Research Council at Wright-Patterson AFB.

Since then, he has become internationally recognized for contributions to the investigation of mechanical energy and how it impacts human-machine interfaces.

Repperger has established himself as a leader in the scientific community by modeling human control performance in complex flight motion environments. His patent was the original in the field of “haptic control devices.” These devices have become widespread in the computer game and flight simulation industry.

The technology has also been applied to the field of rehabilitation medicine and is literally touching and improving the lives of motorically injured and impaired people.

In 1996, Repperger had his pain mitigation research study with the Veterans Administration selected as one of the top one hundred innovations in the United States. It was published in the annual book, Innovations 96, which was endorsed by the American College of Physician Executives. He has also won numerous awards from the Institute of Electrical and Electronic Engineers (IEEE), including the Third Millennium Medal for his technical leadership.

During his time away from the lab, Repperger has been involved in several areas of interest, professional and otherwise. During his first several years with the labs, he worked with local Toastmaster Clubs of Dayton practicing his speaking skills and he participates in debate contests representing clubs at the Air Force Institute of Technology and Huber Heights. @